“Orbital Slots and Spectrum Use in an Era of Interference”

Interference and Telecommunication Services

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Presentation Outline

• Interest in C Band
• Sharing compatibility
• Consideration for the future of C-Band
• Conclusion
Interest in C Band

• Satellite services in C band are very popular because of their resistance to rain attenuation, hence popular for critical services requiring high reliability such as:
  – Banks backhaul link
  – Defense
  – Health care
  – Emergency etc

Image from Satellite Spectrum Initiative
• Terrestrial services on the other hands have been looking for allocation in the C Band for IMT application since WRC-07.

• Though WRC-07 did not allocate C Band globally, some administrations adopted IMT opt-in footnotes in the band 3.4- 3.6 MHz

• WRC-15 A.I 1.1 seeks additional spectrum allocation for IMT on primary basis.

• Frequency bands identified in the scope of A.I 1.1 includes C Band
Sharing compatibility between Fixed Satellite Services (FSS) and IMT in C Band

• Different studies have shown difficulties in sharing C Band with IMT.

In Band sharing
• Studies show that the required separation can go up to 100 Km, and in some cases up to 500 Km (in case of sharing between FSS and IMT micro cells).
• Sharing of IMT-Advanced small-cell outdoor deployment scenarios the required separation go between 30 to 100 km.

Adjacent Band Sharing
• the required separation distance is to tens of km for IMT-Advanced macro-cell
• Up to 5 km for IMT-Advanced small-cell outdoor deployments.
• Sharing between IMT and the FSS in C-Band is feasible but prior regulatory measures need to be taken to restrict IMT power within the separation distance.

• Additional measures like shielding or filtering can be used to reduce the separation distance.

• Sharing should also take into consideration the protection of current services and protect future deployment of the incumbent services in C-Band.
• The report of the WRC Conference Preparatory Meeting (CPM) on the sharing between IMT and FSS in C-Band further concludes that

“Deployment of IMT-Advanced would constrain future FSS earth stations from being deployed in the same area in the bands 3 400-4 200 MHz as shown by the studies.”
Consideration for the future of C-Band

- Agenda Item 1.1 of the WRC seeks additional spectrum allocation for IMT

“1.1 to consider additional spectrum allocations to the mobile service on a primary basis and identification of additional frequency bands for International Mobile Telecommunications (IMT) and related regulatory provisions, to facilitate the development of terrestrial mobile broadband applications.”
• Different methods have been provided in the report of Conference Preparatory Meeting (CPM).

• In deciding which method to satisfy the Agenda Item 1.1 of WRC-15 for C-Band, key rationales should include:
  – The justification of additional frequencies for IMT in C-Band
  – The protection of the incumbent services
  – Consideration of future deployment of incumbent services in the geographical area of interest
Conclusion

• With the development of Broadband services, frequency Band with the capability of more reliability and coverage have experienced an increasing demand.

• Frequency Spectrum being a scarce resource, services seeking additional allocation should clearly justify the need for additional resources in the band of interest.

• In deciding whether to share C-Band between FSS and IMT, Administrations should first consider the protect of incumbent services.
Thank you